J. Waldburg

TERMS—Three Dollars per annum, payable in advance.

THE

SOUTHERN AGRICULTURIST,

FOR THE PROMOTION

OF

AGRICULTURE, HORTICULTURE, RURAL AND DOMESTIC ECONOMY

IN THE

SOUTHERN SECTION OF THE UNITED STATES.

NEW SERIES.—VOLUME VI.—NUMBER 9,

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The Southern Agriculturist.

(NEW SERIES.)

Vol. VI. FOR SEPTEMBER, 1846. No. 9.

From the Columbia South-Carolinian.

AN AGRICULTURAL ADDRESS,

DELIVERED BY THE HON. JOEL R. POINSETT, BEFORE THE STATE AGRICULTURAL SOCIETY, NOVEMBER 27TH, 1845.

[Concluded from our last.]

Another powerful cause affecting the prosperity of States, is found in the absence or presence of manufactures. Both from observation and reflection, I am convinced that a State entirely destitute of manufactures, whatever may be the extent and nature of its staple productions, will always be inferior to one that combines manufactural industry with agricultural wealth. In the first place, materials to a very large amount, which might be worked up to advantage, but which will not bear the cost of distant transportation, are wasted for want of neighboring manufactures. In the next it is destitute of those towns and villages that grow up around such establishments, affording home markets for the produce of the farmer, more advantageous than those at a distance, and supplying him with necessary articles at a cheaper rate, the price being diminished to the amount of the cost of transportation.

Again, manufactures greatly increase the productive resources of a country; the use of steam and water power, and the vast number of mechanical contrivances and labor-saving machines, set in motion by them, augment to an almost indefinite extent the productive industry of the country; while every discovery in science applicable to the useful arts which manufactures give rise to, adds still further to its wealth. It is true that the application of science to agriculture has increased its products, and that we have some few labor-saving machines, but how few and insignificant are they when compared with those that multiply a thousand fold the industrial capital of a manufacturing district? Where manufactures exist, the individuals interested in their success and prosperity, from their proximity to each other, easily unite their efforts for all purposes of common interest, and good roads and canals result naturally from such combinations, and convenient lines of communication are every where established, so as to give to each one his fair share of the advantages of trade. We, on the contrary, live far apart, and meet but rarely to take into consideration, our common interests; and when we do

meet, we remain together too short a time to originate or perfect any great measure of general improvement. In purely agricultural districts, therefore, the products of industry find their way to market by miserable roads and circuitous lines of communication, to the great loss and inconvenience of the farmer.

It may be interesting to us at the South to be made acquainted with the opinions of English Statesmen and economists on the subject of Southern manufactures. They say, "we have no fear of competition from the manufactures of the United States, because the Southern States of the Union, in which the cotton wool is raised, are hostile to manufactures, and from local defects, and the description of people of which the lower orders are composed, never can become a manufacturing country. The competition, therefore, which we shall have to maintain, will be the Northern States, who must like ourselves import the raw material which they are to manufacture."

What are the natural defects on which so much reliance is placed? Have we not abundant water power, a healthy climate and fertile territory? And as for the condition of the lower class of people on which they found their hopes of all absence of competition from the South, there are many white inhabitants in these States whose condition would be improved by being employed in manufactures, and the blacks have been found as well fitted as others to conduct these labors. Nor do I think the co-existence of manufactures and agriculture in the State will in any degree affect the policy hitherto pursued by the South. In my opinion, the principles of free trade are perfectly compatible with the existence and flourishing condition of manufactures. I agree perfectly with those who maintain, that to foster a branch of industry incapable of maintaining itself, is a consumption of national wealth injurious to the country, and that to be permanently and really advantageous, manufactures must grow up spontaneously.

They must be, so to speak, indigenous, that is to say, there must exist circumstances affording especial advantages and facilities for carrying them on, and such I believe will be found to exist in this State.

It is curious and instructive to trace the improvement of agriculture in Great Britain, growing out of the increase of manufactures in that country. Previous to the improvement in cotton manufactures, that is about the middle of the eighteenth century, the industry, population, and consumption of Great Britain had been for some time stationary. England was at that period an agricultural country, and exported grain to a considerable amount. But the improvements in manufactures created a great change. The powers of consumption within the country were enlarged, and home markets were created for its agricultural products. All exportation of grain ceased, although the agricultural products since that period have been more than quintupled. That they have kept pace with the rapidly increasing population within so confined a space, is a

very remarkable circumstance. The importation has been very inconsiderable, as appears from the statements made by Coleman, in his excellent account of the Agriculture of Great Britain. He states that the average importation of wheat into England from 1801 to 1810, when the population was set down at 17,442,912 souls, would have given a fraction over one peck a year to each person.

From 1811 to 1820, when the population was 19,870,589, the quantity imported would have given less than one gallon and a half to each person. From 1831 to 1835, when the population was 25,000,000, the quantity imported would have given to each person one gallon: indeed in the year 1833, 1834 and 1835, the importation would have allowed only one pint and one-fifth for each person—thus showing that the dependence on foreign supplies has been constantly growing less, under a fast increasing population. Now there can be little doubt, that this result is owing to the establishment and rapid progress of the manufactures in that kingdom. In the first place it appears that an improvement in the condition of almost every class of the community followed the advance of manufactures; and that the progressive extension of the use of machinery, so far from lessening the demand for labor, increased it to a great degree. The wages of labor rose, and the laboring man acquired a greater command of the comforts of life. An enlarged consumption of the produce of the soil was the consequence, both of the improved circumstances and of the increased number of the population; more grain and more meat were used, and the transportation of manufactured articles, and of food, for the manufacturers employed more horses, and created a demand for an additional quantity of corn to feed them. The aid of that science which had been created and fostered by the establishment of manufactures, and had contributed so largely to their improved condition, was now called into exercise, to enable the farmer to augment the products of the soil, so as to meet this increased demand, and an enlightened system of agriculture, was the consequence of the united labors of the husbandman and the chemist.

While, however, I am anxious to see manufactures established in the State, because they will furnish a profitable home market for our agricultural products, give employment to our laboring population, and greatly multiply our productive industry; supply our people with all necessary articles, at a cheaper rate than they can be procured from a distance; and bring into use materials now thrown away as refuse; still I am opposed to any measures calculated to drive the people of the State, to attempt supplying themselves with every article of consumption. It is not by raising and manufacturing every thing it consumes, that a nation becomes rich, but by its people being employed in the most profitable manner.

It is only by adhering steadily ourselves to the principles of free trade, that we can convince the nation of our sincerity, and expect to establish the prosperity of our State upon a solid basis. We

ought to be especially cautious, how we qualify their application so as to suit what we may suppose to be our own peculiar interest.

They are universal in their effects upon the prosperity of nations and States, and whenever we perceive the existence of any prejudice against them, or find any adverse theories advanced, it behooves us especially to counteract such prejudices and to examine such theories with the utmost caution and distrust, in the firm persuation, that we cannot admit the partial application of a principle to one portion of the nation, and deny its general truth as regards the whole country.

The desire to correct the balance of trade has been as fruitful a source of unjust taxation, and oppressive discriminating duties as the balance of power has been of desolating wars. It is the stalking horse of the opponents of free trade, and has been the occasion of erroneous legislation in all countries, but especially in England and America: and yet elaborate tables have been published with the sanction of this Society, to show that this State imports more than it exports, and I know not what consequences have been predicted from such a state of things. Nay, the evils are reported to exist already, and we hear of the decline of the ancient prosperity of the State, and of its present miserable condition. Now, as I have from the commencement of my political career, to the present period, been a firm believer in free trade principles, and have always maintained that when a State is not agitated by some great commercial revulsion, or paralized by a stagnation of its trade, the excess of its imports over its exports. is to be taken as the measure of its grain. I looked with great anxiety for the verification of these predictions, and for the evidences of declining condition; but have failed to discern either the probability of the one, or the truth of the other.

It appears to me that South-Carolina has advanced and is advancing in wealth and comfort, if not quite so rapidly as some of her sister States, which have been more zealous and energetic in availing themselves of the elements of national prosperity within their reach, still its improvement has been perceptibly progressive. If rapid and brilliant fortunes have not been made as frequently as in former years, when the State enjoyed almost a monopoly of the cotton market, still a more wholesome, durable and general prosperity is diffused over the land. To go no further back than a quarter of a century; who that has travelled through the interior of our State then, and traverses it now, will fail to perceive its improved condition. Compare the town where we now are with what it then was. In 1820, it extended but a short distance from this spot, possessed scarcely any trade, was cheerless and comfortless to its inhabitants and to strangers, as those of us who were members of the Legislature at that period can testify. Look at it now, with miles of well built houses, full of life and spirit-stirring commerce, the terminus of one rail-way from the sea-coast; and destined to be the centre from whence others will radiate, possessing handsome

edifices, tasteful gardens, good hotels, and presenting in every particular, both the appearance and the reality of a thriving place of business, scarcely surpassed in beauty of situation or in natural and artificial advantages by any inland town in the United States. Of the condition and advance of the upper districts of the State, I can speak as favorably and as possitively.

I reside during the summer months near a village which has grown up as it were under my eye. When I was employed in superintending the public works of the State, Greenville was a small and insignificant village. It now possesses all the elements of a solid and increasing prosperity; churches, schools, and a well conducted public press, incipient manufactures, good mechanics of every description, commercial houses with supplies of all sorts, and a virtuous, intelligent and enlightened people. Nor is the country I pass through twice a year, retrogading or even stationary.

The towns, villages and farms on that route, are all improving. Look at home, and every one of you, and see if your own immediate neighborhood is not in a more flourishing condition than when you first remember it. Many of you were in Greenville last year, and and in Newberry this, and did you not then remark the progress those districts are making? Did you not perceive better houses, better cultivated farms, better stock, horses and swine, and observe generally a more careful system of husbandry than existed there a few years ago?

If this be so, and who can gainsay it, what becomes of the evils inflicted by this long existing unfavorable balance of trade. Does not this state of things call upon us to be cautious how we adopt a theory so totally adverse to the principles of free trade. Depend upon it that the balance of trade like all other subjects dependent upon the skill and enterprize of individuals engaged in the pursuits of agriculture, manufactures or commerce, may be safely left to regulate itself. They will protect themselves from loss, and in doing so, will enrich the country; whereas the inteferance of a political regulator, whether a national legislature or a state institution, embarrasses them, and will in the end, prove injudicious to the class in whose favor it is exercised.

It ought to give us no uneasiness that bread, corn, cattle, horses, mules, hogs, hay and notions of every description are imported into this State to a large amount every year. On the contrary, we should regard the amount of this list of articles with satisfaction, because it indicates to us sure and profitable methods of employing our land and labor, when our staple articles cease to yield remunerating prices. Of all these articles, that which appears to have the least attracted the public attention, is perhaps the most important. I mean hay: I have not been able to ascertain with any precision, the amount of hay imported annually into Charleston; but supposing each horse to consume a ton and a half a year, the quantity must be very considerable indeed, and at the present exorbitant

price, must take from us a large amount of produce or money to pay for it.

I am aware that there exists a prejudice in favor of northern hay; but it is unfounded. I do not hesitate to affirm that well cured Carolina hay, made from the natural grasses of the country, is vastly superior, both in flavor and nutritious qualities, to that which is usually brought to our markets from the north: but if the prejudice can only be overcome in that way, clover and timothy can be raised on our low lands.

The average product of upland grass land, when in good order is, a ton and a half to the acre, and on good meadow, double that amount. This would give in money, at the low estimate of fifty cents a hundred, (and it is now selling for more than double that price) fifteen dollars for upland and thirty dollars for meadow, besides the after grass, either for pasturage or to plough in, as a preparation for grain. It must be taken into account too, that to produce this result, requires very active and diligent labor for only a few days in the year.

But it is not only the money we should secure to our own farmers by prevailing upon them to make hay for sale, but the beneficial effect such a practice would produce upon our husbandry throughout the State, that ought to induce us to use our utmost efforts to effect it. There can be no high farming without hay and turnips or other edible roots.

With these articles of food, we can raise fine cattle and sheep, and with good cattle and sheep, we shall not only have good beef and mutton, hides and wool, but abundant crops of corn and wheat, for they will enable us to cover our fields with manure. If we make hay and raise turnips in abundance, we may import and keep up the breeds of short horn and long horn cattle and of merino, southdown, bakewell, and Syrian sheep. We might by such means produce our own corn and flour, and supply our own markets with better fodder and at a more moderate price. I am convinced that if the planters and farmers of South-Carolina would earnestly turn their attention to hay making, as a part of their annual crop to be sent to market, either in kind or on the hoof, or to be used on their own estates, with a view to high farming, they would add at least ten millions of dollars to the annual amount of the productive industry of the State, and multiply in an equal degree their own comforts, while they permanently improved the value of their lands.

The amount of hay made annually in the State of New-York, is estimated at between six and seven millions of tons, which at the lowest valuation cannot be worth less than thirty-five millions of dollars; this year of general scarcity it is worth double that amount.

I consider the cured blades of corn a bad substitute for hay. However excellent they may be as food for horses and cattle, they are not produced in sufficient quantity; and besides it is very doubtful whether they can be stripped from the stalk at the proper period for curing them, without diminishing the amount of the corn crop

to a greater extent than their value as fodder. This doubt ought to be solved by actual experiment. Hemp is another important product which might be raised to great advantage on our inland swamps, where there exists every facility for preparing it for market. An acre of hemp is to the full, as valuable as an acre of rice, and requires less labor and expense to cultivate and bring it to market. A rice crop not only requires a greater amount of labor than any other in the preparation and cultivation of the land; but after it is threshed out, which is attended with greater difficulty than the same operation with other grains, it is further taxed for freight, milling, cooperage, commissions, &c. &c., from twenty to twenty-five per cent. This is a startling fact, and lessens very much the profits of this culture. Another reason for raising hemp, is to be found in the doubts that exist as to the fitness of cotton for bagging and in the preference given to hemp for that purpose. There is no part of the world where this article could be produced in greater abundance or of better quality.

The olive grows as well here as in Europe or in those parts of America south of us, where it has been cultivated since the conquest. It is a hardy tree, for it has resisted some of our severest winters. And it is a mistake to suppose that it will thrive only within the influence of the sea air; for I have seen very fruitful olive groves on the table land of Mexico, at a distance of at least three hundred miles from the sea coast.

I am thoroughly convinced that good wine might be made in South-Carolina if we would lay aside all attempts to raise the vine, for that purpose, on poor sandy soils, or on any land not abounding in calcareous matter. If we cast our eyes over those countries where the best wines are produced, we find the culture limited to the belt of limestone which traverses Europe, and to volcanic soils. A similar belt, not so wide, but equally abounding in lime, runs through the southern States, and if advantage were taken of that circumstance, and of the peculiar adaptation of the climate of the upper country to the cultivation of the grape, good wines might be made here.

It is a mistake, however, to suppose that really good wine is to be manufactured by the same process that our domestic wines are made. Those who attempt it, without the necessary knowledge and practical experience, will scarcely succeed in making good vinegar.

We may raise grapes for the table every where, for we can add the carbonate and phosphate of lime to the soil of a small grapery, and we can make a tolerable domestic wine for immediate use; but if we desire to possess vineyards and to manufacture wine for sale, we must cultivate our calcareous soils, and import the art of making wine from France. There the Vigneron or husbandman who tends and dresses the vines, knows as little about the management of the juice of the grape, so as to convert it into good wine, as

we do. The process is a very complicated one, and is in the hands of very experienced, as well as intelligent manufacturers.

In the best cultivated countries in Europe, the seed plants which yield oil are much esteemed, and, as a rotation, are found very profitable. Among these are the Poppy, and Rape or Colza; not that species grown in England, the *Brassica Napus*, but the *Brassica Campestris Oleifera*, which is largely cultivated in France and Flanders, where it intervenes between two culmiferous crops. The culture is like that of the turnip. The seed forty or fifty bushels to the acre, on good soil, is crushed for oil, the cake being either fed to cattle or restored as manure to the land, and the haulm cured like hay, and fed to cattle in winter.

But perhaps the best oil plant that can be cultivated in this country is the Bene, *Sesamum Orientale*, introduced into this Carolina from Africa, where it is used as an article of food.

This plant deserves a place in every garden, on account of the medicinal properties of its leaves; but it might be profitably cultivated for the oil it produces which is incorruptible, and after being kept a year or two, is equal to good olive oil for the table, and burns as well as any other vegetable oil in use in Europe.

There is another subject that immediately concerns our agricultural interests, which has always appeared to me to require farther elucidation. I mean the cultivation of our inferior lands. We find great zeal evinced and industry exercised in attempts to bring the pine barrens and other poor lands in the State into successful cultivation. Our agricultural papers teem with speculation on this subject, and frequently contain accounts showing how these lands may be made to produce the vine, the mulberry, fibrous and other plants. Now surely all this is premature, for all these plants will grow better, and produce more when cultivated on good soil: and there is no axiom in political economy better borne out by experience than that you cannot resort to inferior lands without raising the price of produce or diminishing the profits of labor.

There cannot be two or more prices for the same article in the same market, and that price must be such as will afford the ordinary rate of profit to those who raise that portion of the supply produced upon the worst lands, or they ought not to be brought into cultivation. In rich and populous countries, the cost of producing all alimentary and manufactural articles, under the most unfavorable circumstances and at the greatest expense. determines the average price of the rest, and the inferior lands can only be cultivated to advantage when the demand is so great that it cannot be supplied without them. We find, therefore, the price of agricultural products is always higher, and continually rising, in countries already thickly settled, rich, and still advancing in wealth and population, because it has become necessary to resort to poorer lands; the price rising in proportion to the expenditure of labor and capital in producing the necessary supplies. Now surely we ought not to anticipate such a state of things, by attempting to bring our very inferior

lands into cultivation, before all our good lands are reclaimed and settled.

It will be time enough to speculate upon the best manner of cultivating our pine barrens, when both the demand for supplies and the agricultural population of the country increase in such a manner as to require a greater expenditure of capital and labor to produce the same results.

You are all too well acquainted with the condition of our State, not to be aware that we are yet very far from experiencing this necessity, and that it abounds in excellent lands, some of which are still in a state of nature, while others have been abandoned merely because they were not suited to the culture of rice. These inland swamps might, with very little labor, be converted into excellent farming land, and be rendered, at least, as productive as they ever were, by a very moderate outlay.

At the risk of being tedious, I cannot forbear urging upon the Society the great importance of giving frequent practical instructions to the farmers of the State. Point out to them the great waste of labor occasioned by repeating the cultivation of the same crop upon the same soil, without rest and without any intervention, and the ruinous effects such a course produces upon the land. Teach them that not only the same grain cannot be sowed in succession without injury to the land, but that all those plants which extract the same ingredients from the soil, deposit a similar residium, and are subject to the same diseases, and furnish food to the same insects, must not succeed each other; and that even the fallow crops of turnips and clover are subject to this law; that in cultivating light soils a rotation of such plants as derive their chief nourishment from the atmosphere will best contribute to restore the fertility of the land, and will in most cases, be sufficient to do so; whereas, in heavy and clay soils, no rotation can be regarded as complete which does not embrace a bare fallow, and that, by this means, the land is to be kept from producing any vegetable that ripens its seeds, which can only be done by frequently ploughing, harrowing and cleaning it, as well to prevent all root-weeds from ripening their seeds, as to expose the tenacious soil to the mellowing influence of the frost and sun, and the insects to be destroyed by the same process.

If these rules are frequently enforced by the Society, and the great advantages to be derived from deep and subsoil ploughing, and generally by high farming insisted upon, the most beneficial effects may be expected.

I met with an observation lately in an English Agricultural Essay, which ought to make us ashamed of our negligence. In speaking of the great importation of bones from America into Great Britain, the writer says: "The demand in that part of the world will surely open the eyes of the farmers there to their use, and make them reflect that bones must be worth more for home consumption than

the seven or eight dollars a ton which the English agents pay for them. How striking, he goes on to say: to see the awakening intelligence of a few thousand agriculturists in our Island thus rousing a spirit of inquiry, and pushing forward the art of culture in the most remote parts of the world."

This is rather mortifying language: but let us profit by the lesson, come in what shape it may. It exhibits to us in a strong light the necessity of acquiring scientific information on every subject connected with agriculture, in order to protect our own interests, a knowledge which can only be acquired by retaining, in the employment of the State, men of science, capable of imparting it to the people. Our farmers generally, are not, themselves, able to ascertain the qualities of the land they cultivate, and yet there can be no high farming, the most profitable, when skilfully conducted, without this information; for unless the farmer is acquainted with the component parts of this soil, or has access to those who can instruct him, he is exposed to the risk of adding to it costly materials in which it naturally abounds, and of omitting those in which it is deficient. The Geological surveys have already added very considerably to the agricultural wealth of the State. The discovery of inexhaustible beds of marl is of inapreciable value, and will enable some favored portions of the State to compete successfully in the growth of cotton, and in raising provision crops with the naturally fertile lands of the South-Western vallies.

Other sources of mineral manures will be brought to light by the Geologist. He will trace out limestone wherever it is to be found, and convey such instructions as to the best manner of burning it, as will cheapen that important fertilizing agent.

An abundant and cheap supply of lime would improve the fertility of the grain growing districts, and render them sufficiently productive to furnish the rest of the State with flour. Science will likewise teach us the best methods of irrigating our meadows and portions of our upland, so that we may supply the hay which is consumed in the State, and which now costs us so large an amount.

In short, by the continual employment of scientific men in the service of the State, Geology, Chemistry, Geography and Botany, in all their beautiful applications, and in all their varied relations to each other, will be made to contribute to the progress of agriculture.

I cannot take leave of you brother farmers, without congratulating you upon the beneficial results of your associated exertions, and exhorting you to persevere in your laudable efforts for the improvement of the State agriculture.

Be assured that every step of your progress towards a more perfect system of agriculture, advances the comfort and happiness of your fellow citizens, and tends, in an eminent degree, to promote the wealth and prosperity of the State.

From the Philadelphia Saturday Courier.

SCIENTIFIC AGRICULTURE.

BY A DISCIPLE OF ENGLISH AGRICULTURAL SCIENCE.

"You know very well," Science said, "how your neighbor, old Peter Stubborn, went into the next State to buy a farm. The owner knew what the farm was, and advertised it in spring time, when the expected damp weather. I advised Peter to take me with him to view the strata of rocks below, and to analyze the soil on the surface; to see how it laid for draining, and what aspect it presented to the atmosphere. I told him I could save him my expenses many times over. But Peter scorned my advice—he thought he had worked more land than I had, and was as good a judge of land as any man in the States; and he set off muttering something about 'not letting book-worms make money out of him.' He walked carefully over the farm—it looked green and flourishing, and not swampy even in that damp, wet weather. He was delighted with it, and gave forty dollars an acre for 300 acres. He paid his 12,000 dollars, and took possession. But in the summer time, as I passed that way, I found that so much praised farm burnt up almost with drought, and its vegetation drooping and panting for moisture, which the soil could not supply! Peter had bought a light, sandy soil, laying upon what we call, geologically, a coal formation, with a pretty decided slope towards the eastward. I took a little of the soil and analyzed it, and showed him what it contained. In one hundred parts there were about 83 of silica or sand, 5 of alumina or clay, 3 of lime, 3 of oxide of iron, 1 of potash, 1 part of phosphoric and carbonic acids, and 4 parts of vegetable and organic matter. Now, I said, this soil will be beautifully productive in wet weather, but will be parched in dry weather.

"'Ah' he said, 'that was how I was taken in. I saw it in a wet spring season.'

"'If' I rejoined, 'you had taken me with you, I would have taken a handful of this soil from various parts of the farm, and would have told you exactly what it contained, as I do now. I would have told you that sand, which predominates here, cannot easily retain moisture when the sun acts powerfully on it, as the air readily blows into it and the moisture flies off;—nevertheless, I would have told you that in certain positions this soil might be made fruitful, if it laid upon a favorable geological formation, and with a moist, atmospheric aspect. I should then have examined the geological strata here, and have told you it was on a coal formation, consisting of beds of limestone and blue shale, near the surface, which generally underlays the worst lands—and sloping so rapidly towards the East, the moisture would drain away through the sands and down the slope, while the East wind, the most drying and piercing of all winds, would blow with its keen droughty breath *into* the sandy soil, driving out that moisture which had not drained

away; that in summer your crops would be impoverished, and in long droughts probably would not grow at all. I could have shown you all this, and you would have known that the farm was of small value, and saved your money. Your ignorance has caused you to throw away as much as you have made in many years of hard work. 'But' I continued, 'since you have bought it, I can instruct you how to improve it, by mixing with other soils, and to make a profit from it by showing you the composition of the land, and the kind of plants it will best grow. To gain this knowledge it will cost you something——'

"'O! then,' said Stubborn, 'I will have nothing to do with it, for the place has cost me too much already.'

"I left to his own course. Now, if Stubborn had spent a few dollars a year in buying books and attending lectures, and had employed his hours spent in patching up old harness, or in taking a sleep over his fire in winter evenings,—in reading, study and experiment, he would have saved some thousands of dollars in his farm, and would have known how to make the best of it when he had got it. But he thought me too expensive at a few dollars and a few evenings per annum, and took his own course. *He is out of pocket by it.* He is an extravagant and a spendthrift man, though he thinks himself saving, even to penury."

Then again, on a smaller scale, you have another instance. Your neighbor Timothy Hearsay, heard that plaster of Paris was a fine manure, and had produced, for a friend of his, a wonderful crop of turnips. I saw Hearsay carting on to his twelve acre field an immense quantity of gypsum, (or plaster of Paris.) I asked him why he did so: he said a friend had found it to be a good thing for turnips. I asked him if he knew what his soil was made of—and what the crop he wished to raise was composed of? He said he *did not.* I pointed out to him the folly of applying a manure which either his soil might have in abundance already, or which his crop might not require at all. He gave me an impertinent reply, and I passed on. He sowed wheat, and had a bad crop. I could have told him that if he had analyzed good wheat, its ashes would not contain above a two hundred and fiftieth part of plaster to the whole —scarcely a trace, and therefore in putting gypsum to *wheat,* he put what the plant did not live on, and would not eat, so to speak. Hence his labor had been quite useless, and his plaster, which cost him, in purchase money and labor, thirty dollars, was worse than money thrown away. By his not taking me for his guide, he spent thirty dollars of hard *money,* and lost, as far as that field was concerned, a year of valuable, irredeemable *time.* He looked puzzled at the result, and wondered how his friend's turnips prospered so well with plaster and his wheat so badly. I took a turnip and analyzed it; I showed him that the ashes of its root contained 25 per cent. of the plaster of Paris, in the form of sulphuric acid and lime, and the ashes of its leaves contained no less than 39 per cent. —proving that nearly one-third of the whole incombustible matter

of the plant consisted of plaster of Paris, which it sucked up from the soil. "Thus you see," I said, "the turnip lives greatly on this manure, while wheat scarcely touches it; a turnip grows fat on the food that wheat would starve with. Had you known the composition of wheat and turnips, you would have saved your money and crops."

By and by, Hearsay heard it reported that I had said plaster of Paris was an excellent thing for clover. To redeem his character, he bought a lot more, and applied it with the assurance of being right this time. He top-dressed 12 acres of a 14 acre field in Spring, with 3 cwt. to the acre, and triumphantly waited the result. Excessive was his chargin when he found the two acres *untouched* were, if any thing, better than the remaining twelve acres he had so expensively manured. He complained to me. I asked him, as before, if he knew "the constituents of his soil, whether it needed plaster of Paris; and of his crop, whether it required it for food?" No, he said, he had heard from me that clover contained plaster of Paris, and he thought he was doing right to give it some—but he knew nothing about the soil.

I analyzed his soil, and found that it contained, naturally fresh and unexhausted, an abundance of gypsum.

"Ah, Hearsay," said I, "what you would save if you would let me come and live with you. I could have told you your soil had abundance of plaster already; it wanted no more; and your purchasing plaster, and hauling it so my miles, was as wise as if you had hauled a ton of coals twenty miles to burn at the mouth of a coal pit, where they were laying blocking up the entrance. Here is more money thrown away."

Hearsay took me to live with him at once. I cost him four or five dollars a year; but I raise, expand, and delight his mind. In dark winter nights, I show him the beautiful resources of nature; we make wonderful experiments, which instruct and amuse ourselves, and teach his family. We see the glorious wisdom of our Almighty Father; and he saves money and labor at every turn, and all the year round. I am worth hundreds of dollars per annum to him.

"Now, friend Practice," continued Science, "I won't keep you standing much longer, lest I should *tire* you, which I make a rule never to do with my pupils; but I will just give you another example how I can save farmers the small expense of my maintainance and residence with them. You know your intelligent friend, Sidney Experiment, over at Trial Valley farm. I had a great respect for Experiment; he had an active, inquiring mind; tried all new manures, and all new plants. In some things he succeeded—but in more things he failed. He often consulted me, wishing to know if this was a good manure for wheat, or that a good manure for corn. If this would produce a good yield, or that a fine pasture. He used to spend an immense amount of money in artificial fertilizers. He sent to Peru for guano—to India for nitrate of soda. He burnt

down forests to make potashes—and dug immense pits to procure brine and make salt. He roasted iron pyrites to make sulphuric acid—and made a general gathering of bones. In short, he tried every thing he could hear of. I often pressed him to begin at the beginning, and study agriculture as a science—*to study first his land, then his crops,* AND THEN HIS MANURES;—but he was so busy with his experiments he had not time—nor did he believe me when I told him that such a study would perhaps save him years of time, which he was spending in hap-hazard experiments, and expensive, perhaps fruitless or even injurious attempts at manuring. I made no impression upon him. He worked in his own way, gaining little wisdom, and losing many golden opportunities for acquiring solid knowledge and substantial profits.

"On day I called upon him, and observed him standing beside a workman who was cutting a trench to carry off a quantity of brown fœtid liquid which had gathered in holes in the farm yard, and was sufficient, as he said, to breed a fever or a pestilence. He was going to drain them all into a rivulet which ran past his house, and so get rid of it. Stop, said I, before you do that, bring me a bucket full of that liquor. Now, Mr. Experiment, you send all the way to Peru, and bring guano at a cost of forty to fifty dollars per ton—from India you bring nitrate of soda at a cost of seventy dollars per ton—bones you gather, grind, and dissolve in sulphuric acid, at a cost of not less than fifty or sixty dollars per ton—and even at these prices, with judicious application, they are good and profitable manures. But is it not wonderful, that while you gather these things from afar, at a vast expense, and apply them with assiduous care, you should throw them away when found at your very door, blended and mixed in most valuable proportions, and all ready for use. This dirty liquor you are throwing away, holds all these ready dissolved, and you might as well, and as wisely, empty into your rivulet, bags of guano, barrels of nitrate of soda, carboys of sulphuric acid, and bushels of bones. You look amazed. Yet so it is.

"Inquire how this liquor came into those dirty pools. It has run from your stables and cow-houses, in the form of water, washing down in its course the richest of the saline particles of the manure laying there. It has also run from that large dung-hill, where vegetable and animal substances are decaying and fermenting: generating in that process of decay, the most valuable of all fertilizers. They generate and give off *carbonic acid gas,* one of the most nutricious of the foods of plants; and as rain-water falls upon and runs through this dung-hill, it absorbs this carbonic acid, and carries it off with it to the pool of dirty water beneath. *Humic* acid is formed in this heap by the same decomposition, and is so nutritious a food for plants, that one and a half per cent. of it in a soil would throw Liebig into raptures. A portion of this is washed down into that dirty water. From the ashes and sweepings of your house, thrown on this manure heap, as well as from the decay of its general matter, a liquid lye is drained, which every body knows contains

the *potash* for which you cut down your forests. Again, wherever the decomposition of this dung-hill goes on in contact with the open air, corrosive acid is formed called *nitric acid*, which is the aquafortis of the shops in a state of chemical combination with the decaying matter. To obtain this valuable salt artificially, you would have to purchase sulphuric acid and saltpetre and mingle them together. Yet here you have it ready formed, and washed into this dirty water. This nitric acid combining with the potash which we just noticed as being washed out of the dung-hill, makes the *nitrate of potash*—a manure for which you would have to pay eigthty or ninety dollars per ton. The same nitric acid, combining with the soda in the *humus* already noted, makes the *nitrate of soda* which you bring from the East Indies. From the water which has flowed out of your cow barns, piggeries and stables, are produced the very substances for which you so much value the guano of distant Peru. *Ammonia, urea, and phosphates of lime and soda*, are found in considerable proportion in this waste liquor. Go into your stable after it has been pent up all night, and you will find the effluvia of the ammonia sometimes strong enough to make your eyes smart and intercept your breath. Take a little guano in a spoon, wet it with water, and mix a pinch of quick lime in powder with it to dissengage the ammonia, and then smell it; it will have a powerful and pungent odour of the sal ammonia, or volatile salts of the Druggist; take a spoonful of this liquor, as it lays rotting and fermenting in the sun, dash in a small powdering of quick-lime, and the ammonical gas will fly off with similar though weaker effect. Take a thousand ounces of the urine as it flows into the puddle, analyze it, and you will find it contains 55 ounces of *ammonia* and *urea*. In 1000 ounces of the guano of Peru, by analysis, you will find 210 ounces of these same peculiar and powerful chemical agents, not quite four times as much, which proves that, in *this respect* this dirty filth is worth rather more than one fourth of the value of guano: in other words, that less than 4 lbs. of this liquid, which you were going to drain off by the hundreds of gallons, is equal in value to 1 lb. of guano. In this analysis you will find 8 ounces of the phosphates of ammonia, lime or magnesia—the agents for which you purchase and dissolve bones: and about 7 ounces of the sulphates of ammonia and soda, with 2 or 3 ounces of ccmmon salt; all valuable manures.

Thus, Experiment, you would have drained away the constituent parts of your most valuable and costly manures. Had I been with you, I would have taught you to FIX those escaping ammonical gases which poison your stables, and float into the air from your dung-hill, to the prejudice of the health of your animals and your neighborhood; to preserve most carefully all that brown waste liquor, either by drains leading into tanks, or by draining it into a water-tight pond beside your manure heap, and every other day bailing it into the heap with dry sulphuric acid, (or plaster of Paris,) to fix its evaporating gases, and thus add riches equal to your imported manures, daily to your compost, and FREE OF COST. You,

of all men in the world, must study nature chemically and scientifically. Let me come and live with you, and in your leisure hours I will teach you the value of the old proverb—"*That muck is the mother of money.*"

I have lived with him since, and he finds the acquisition of knowledge quite a simple and a pleasant thing; he smiles at his former blunders, and sees how much he has lost by not beginning my acquaintance sooner.

When Science had ceased, Practice determined at all events to give him a trial. He had many fears "that he should make nothing out"—and be a "dull scholar," but encouraged by the mild aspect and kind language of his instructor, he asked him to come in and take up his abode with him, and commenced taking his first lessons in the Science of Farming and Agriculture.

INDIAN CORN.

In the *Southern Cultivator* we find the following novel and original theory about the cultivation of Indian corn. Authority may be found for the idea in the analogous practice of some orchardists, who "ring" their trees to prevent the accumulation of woody fibre, at the expense of the fruit. We have been frequently struck at the great disproportion between the yield of stalk and of grain in our Southern corn; it was never more remarkable than it will be during the present year. We are not fond of running after new notions, but really we think this matter is worthy of note, and we should be glad to see it fully discussed before another season.

[*Editor of the Southern Planter.*

CORN—LARGE STALKS AND SMALL EARS, *vs.* SMALL STALKS AND LARGE EARS.

The manner of making large stalks and an abundance of fodder and small ears, is to plant your corn early. Manure the hill with cotton seed. Cultivate with the plough in such a manner as you think best calculated not to interfere with the roots by superficial culture throughout; and a good harvest of stalks and leaves will be the result of your labors; and more particularly if (as is almost invariably the case,) you have a seasonable spring and a little drought in the summer.

If you, on the other hand, desire to make large ears of corn and small stalks, you will plant also early, say by the 10th of March for this latitude, and cultivate in the most approved method, until the third and fourth ploughings. Then run a coulter each time as near the corn as you possibly can, and break all the lateral roots. This idea may alarm you, but read on until you have gone through, and then for myour judgment of its utility.

Of all things, I desire my corn to be checked in its growth in May and first of June, either by a spring drought or by artificial means. And I do suppose that you will admit that by checking the growth of a stalk of corn that a small one will be the certain result; though I do not wish it to be too small to bear a good ear. Now if the small stalk is conceded, I will endeavor to explain how the large ear grows upon it, and my object is attained. After the corn is checked at the proper time (and of which every planter must be his own judge, taking into consideration the age,) so as to reduce the size of the stalk below that which the land would ordinarily admit, you may then cultivate the corn with sweeps or any other plough that will not disturb the roots, and lay it by clean and loose, and you will have small stalks and large ears of corn. Land is generous and will do her utmost all the time, but will grow faint under the great weight she has to carry, before that time when her energies are most needed, unless favored. You will then perceive the propriety of holding something in reserve for her assistance when the conflict is at hand, that of maturing the ear, and not allow her to carry such a stalk as will require all her strength to support, and leaving nothing for the benefit of the ear.

We generally have a drought about earing time, (which is a great affliction to a large stalk on poor land) in this country, and a small stalk treated in this way, by this time will have a plenty of roots, in an improved condition, and will stand a drought better.

Experience proves that a dry spring and a wet summer is attended with an abundant harvest, and, "*vice versa*," a wet spring and a dry summer bring on the reverse. It is, therefore, necessary that we should so cultivate our land that the crop may be acted upon in as near approach as we possibly can to those effects resulting from a dry spring. And that principle is to check your crop. If you were riding a four mile race, would you whip and spur from the word "go," and all the time, whilst your more knowing competitor, who had checked his horse for two or three miles, should in the last struggle pass you with ease? I presume you would not, and the principle is analogous. I do not say, like some of our ancient farmers, that I run my plough close and break the roots to make the corn grow fast, but for the opposite purpose, so that when the time of its maturity rolls on it may possess all the advantages that can be given by that soil which has been temporarily resting from her labors. And I would here observe that whoever may undertake to profit by this method and should fail in a full crop, or should not come up to their expectations, they must duly consider the cause and they will discover something else to which they may attribute the failure; for instance, that of hill-manuring with cotton seed, as it stands in direct opposition to the principle which I would desire to establish, unless the seed was put on when the corn was half grown. So, in conclusion, you will discover that my object is to show tha either additional strength must be given the land at the

time of maturing crops or that a portion of its natural powers should be retained by cutting off all communication which produces a redundant growth, and then, as the doctors say, "assist nature in her efforts" with skill and industry.

Yours, &c.
J. C. S.

Danburg, Ga. April 6, 1846.

CULTURE OF INDIAN CORN.

For several years past something of a debate has been carried on in reference to the utility or safety of breaking the roots of corn in the process of its cultivation.

On the one hand, the directions are, to use a cultivator, and employ a very shallow culture; so as to avoid all injury to the roots of the plants; inasmuch as these often run near the surface, and to a considerable distance. The breaking of these roots, it is supposed, must weaken the plant and deprive it of its power to produce and perfect its grain.

On the other side, it is directed to use a plough, and put it well down, so as to stir the earth deeply—no matter if it does break the roots—the corn never minds it. Those who give these latter directions plead fact and experience on their side.

We presume both sides to be right; and that the difference in their directions grows out of the difference of the circumstances from which they originate.

One man has a poor piece of ground, which he is obliged to manure highly and cultivate thoroughly, to secure a crop. The corn requires all the nutriment it can find in the soil, and all the roots it possesses to find that nutriment. There is no tendency of the crop to grow too great a proportion of stalks at the expense of the grain; but both grow in a due proportion to each other. The owner of this crop says, "Do not plough among your corn after it has attained some size, for the damage you will do the roots must injure it;" and he says rightly.

Another man, living on some of our Western alluvials, with a soil ten feet or more in depth; whose corn pushes upward from ten to twenty feet in height, covering the ground like a piece of jungle, says, "Put in the plough—let it go deep; the breaking of a few roots will benefit the corn;" and he says rightly. The effect of root pruning is to check the growth of foliage, and stimulate the growth of fruit or grain; and we know of no reason why its application will not tend to the same results with a crop of corn as with any other plant.

This seems to us to be the true solution of the difficulty, and to afford the rule upon which the farmer may operate safely. He should decide whether his crop requires stimulating, or whether the foliage may safely be checked; and the application will be easy.

[*Prairie Farmer.*

From the Columbia South-Carolinian.

FODDER.

CORN CULTIVATED FOR THE STALK AND NOT FOR THE EAR OR BLADE.

It is believed that the average crop of corn and oats in Georgia and South-Carolina, does not exceed twelve bushels per acre. Upon this, and the fodder gathered from the corn, we place our dependence for the sustenance of the animals employed in our agriculture. To produce a sufficiency, we are compelled to enlarge our plantings of these exhausting crops, and we devote to these purposes land already impoverished and requiring rest. Among the ultimate consequences of such a system, are abandoned plantations, and emigration. To mitigate this evil, and to assist in the maintenance of our animals, I propose a fodder patch, that is, the cultivation of Indian corn expressly for the stalk, and not for the ear or blade. I propose this stalk fodder, not as a substitute for grain, but as a valuable auxiliary—rendering, in fact, the grain given more efficacious, and enabling the animal to do with less. For the last six years, I have devoted to this purpose a small lot of land, and I estimate the product so highly, that nothing would induce me to abandon the culture. At the usual corn planting season, this lot is trenched four feet apart, with a bull-tongue plough, and in these trenches we sow the common Indian corn, at the rate of two bushels and upwards to the acre. During its growth, this corn receives two or three ploughings, and this is all the culture it gets—it is neither hand-picked nor hoed. At every ploughing, the earth is thrown fearlessly towards the corn, which would be buried and destroyed, were it not that the mass of plants growing in the trenches, enables it to resist the pressure of the earth thrown against it. By this treatment, every particle of grass growing at the root of the corn, is completely destroyed.

When the fodder corn begins to tassel, we begin to use it, and not before. The reason is manifest. It is a well known law of vegetable life, that when plants are in bloom, then their mucilaginous, saccharine, and nutritive properties, are most fully developed. This is proven by the fact, that if herbs be gathered for distillation, or grass be mown for hay, before the appearance of the blossom in both instances, they yield no valuable products. To this law, Indian corn constitutes no exception, and hence our reason for waiting until it tassels before we commence using it. If gathered before that time, my persuasion is, that the stalk is of little or no value.

We wait then until it tassels before we begin to use it. The ploughman, with a short scythe or sickle, cuts it up at the root, takes it by large arms-full to the cutting-box, and when cut, it is mixed with chopped oats, and given to our working animals. I feel satisfied, when a sufficiency of this chopped corn-stalk is mixed with their oats, that plough horses and mules will do with one third,

perhaps one-half less grain. Besides, while using it, no other forage is required, and this is no trifling convenience. When planted at the usual season, the fodder corn begins to tassel about the 20th June. It comes in at a time when there is frequently a pressing necessity for fodder—when the ploughs are in full action—when animals require food of nutritive kind, and when frequently the blade crop of the preceding year is totally exhausted.

We continue to use this fodder corn as long as it lasts, and it has this great recommendation, that the longer it stands until actually killed by frost, the more palatable it appears to become to animals. After the tassel has dried up, when every blade hangs down, and has become colorless, when in fact, from external appearance, we would pronounce the plant actually dead, the stalk will be found to be still perfectly green. I have satisfied myself of this fact, by repeated observation. I have gone into this fodder patch for several years in succession, as late as the middle of October, and have invariably found the stalk of the corn green and more rich in its nutritive properties, than at any preceding period. The juices of the plant, after being elaborated in the leaves, appear to be concentrated in the stalk, and it contains at that time, so much saccharine matter, that it approximates its taste to the upper joints of the sugar cane itself. That this protracted vitality of the stalk is owing to the fact, that the plant is never deprived of the blade, I have not a shadow of doubt. At the very time in October when I found the stalk of this fodder-corn green, crisp, and juicy, the stalks of the crop-corn from which the fodder had been gathered at the usual season, was dried up and dead. I infer from these facts, that the early gathering of fodder is a pernicious practice—because, by impairing the vitality of the stalk of the corn plant, when in the very act of perfecting the ear, it necessarily interferes with the complete maturity of the grain. I advance this as no novelty, but only to reiterate an important agricultural truth. It has been demonstrated by repeated experiments among the farmers of the Middle and Northern States, that "topping corn" seriously diminishes the amount of the crop. By parity of reason, the abstraction of the fodder before the maturity of the grain, must be attended with consequences proportionably injurious. It is the general impression of planters, that the ear of the Indian corn is completely matured at time of gathering the fodder, and hence that no injury results from taking away the blade. I generally doubt the correctness of this impression; Indian corn being an annual, the whole energies of the plant are directed to the perfection of the ear, all the other parts of the plant are but the ways and means provided for the accomplishment of this end. Now, it seems to me reasonable and probable, that as long as the leaves and stalks remain green, they continue to impart something of value to the ear. The strong sympathies which are known to subsist between the ear, the stalk and the blade, go to confirm this opinion. If the green ear is destroyed by a squirrel, the leaves of that plant soon become discolored, and it prematurely

dies. If the blades be stripped when the corn is in mutton, the stalk perishes, and the ear is shrivelled and light. You can mutilate no one part of the plant, without inflicting serious injury on the other two.

Could we abandon the gathering of fodder, we should in many respects be greatly the gainers. The plant would escape mutilation, and consequently the ear would be completely perfected; the grain would be plump and heavy; would measure further, and fatten more. Besides, there would be the gain of time. There is no work done on plantations, which makes so poor a return for the labor expended. I have heard practical men say, that a smart man will, with a scythe, cut a greater weight of hay in a day, than any five hands can gather in blades. As far as my experience goes, this falls short rather than exceeds the truth.

But the question is asked, what shall we use in lieu of blades. My answer is, we have more land capable of yielding hay than we imagine. Upon every plantation, there are low grounds, shallow ponds, and patches of swamp, devoted commonly to rushes, brambles and gum sprouts, which, if drained and ploughed, yield handsome crops of hay. Our ordinary high lands produce tolerable crops of grass, if cowpened and ploughed. Another resource is that of cutting the grass which springs up on our stubble lands, from which crops of small grain have been taken. Another source of supply would be this fodder-corn I am recommending. Two or three acres of good land appropriated to this purpose, would furnish a large supply of forage. The corn might be cut and stacked in the fields, as is the practice of the farmers of the Middle and Northern States, and this might be done at any time in September or October, as would best suit the convenience of the planter.

Fodder diligently gathered from these sources, would at least enable us to dispense with a part of the blade crop. The stripping might be postponed until the blades below the ear were dead. By that time, the grain would be so far matured, that it would suffer far less than happens when every blade is green at the time of gathering.

I have never yet ascertained the weight of an acre of fodder-corn, but have no hesitation in saying that it is very great. One acre of good land will furnish an abundance of forage for four horses for three months. Mules appear to be especially fond of it, and cows running upon ordinary pastures, will, if fed with these chopped corn-stalks, double their butter in a few days.

CARROTS.

S. Brown, in the Boston Cultivator, says: "We have fed two farrow cows with carrots from the time of housing to the present date, and the result is, they have given nearly twice the quantity of milk they would have produced without them, and of a richer quality; the butter made from them, churns quick, and is nearly equal to June butter."

LIEBIG'S PATENT MANURES.

These manures have been patented, on Dr. Liebig's behalf, in the name of Mr. James Muspratt, of Liverpool.

The object of the invention is to prepare manure in such manner as to restore to the land the mineral elements taken away by the crop which has been grown on, and removed from the land, and in such manner that the character of the alkaline matters used may be changed, and the same rendered less soluble, so that the otherwise soluble alkaline parts of the manure may not be washed away from the other ingredients by the rain falling on the land, and thus separating the same therefrom. And it is the combining carbonate of soda or carbonate of potash, or both with carbonate of lime, and also the combining carbonate of potash and soda with phosphate of lime, in such manner as to diminish the solubility of the alkaline salts to be used as ingredients for manure (suitable for restoring to the land the mineral matters taken away by the crop which may have been grown on, and removed from the land to be manured,) which constitutes the novelty of the invention.

Although the manures made in carrying out this invention will have various matters combined with the alkaline carbonates, no claim of invention is made thereto separately; and such materials will be varied according to the matters which the land to be manured requires to have returned to it, in addition the mineral substances above mentioned. The quantity of carbonate or phosphate of lime, used with carbonate of soda or potash, may be varied according to the degree of solubility desired to be obtained, depending on the locality where the manure is to be used, in order to render the preparation less soluble, in localities where the average quantity of rain falling in the year is great; but as in practice it would be difficult to prepare manures to suit each particular locality with exactness, such average preparation is given as will suit most localities. In making manure according to the invention, carbonate of soda or of potash, or both, are fused in a reverberatory furnace, such as is used in the manufacture of soda-ash, with carbonate or phosphate of lime, (and with such fused compounds other ingredients are mixed,) so as to produce manures; and such composition, when cold, being ground into powder by edge stones, or other convenient machinery, the same is to be applied to land as manure. And in order to apply such manure with precision, the analysis and weight of the previous crop ought to be known with exactness, so as to return to the land the mineral elements in the weight and proportion in which they have been removed by the crop.

Two compounds are first prepared, one or other of which is the basis of all manures, which is described as the first and second preparations.

The first preparation is formed by fusing together two or two and a half parts of carbonate of lime with one part of potash of com-

merce (containing on an average sixty carbonate of potash, ten sulphate of potash, and ten chloride of potassium, or common salt in the hundred parts,) or with one part of carbonate of soda and potash, mixed in equal parts.

The second preparation is formed by fusing together one part of phosphate of lime, one part of potash of commerce, and one part of soda ash.

Both preparations are ground to powder; other salts and ingredients in the state of powder are added to these preparations and mixed together, or those not of a volatile consistency may be added when the preparations are in a state of fusion, so that the manure may represent as nearly as possible the composition of the ashes of the preceding crop. This is assuming that the land is in a high state of cultivation; but if it be desired to grow a particular crop on land not in a high state of cultivation, then the manure would be applied in the first instance suitable to the coming crop, and then, in subsequent cases, the manure prepared according to the invention would, as herein described, be applied to restore to the land what has been taken therefrom by the preceding crop.

Preparation of manure for land which has had a wheat crop grown on and removed therefrom.—Take of the first preparation six parts by weight, and of the second preparation one part, and mix with them two parts of gypsum—one part of calcined bones—silicate of potash (containing six parts of silica,) and one part of phosphate of magnesia and ammonia.

An such manure is also applicable to be used after growing barley, oats, and plants of a similar character.

Preparation of manure for land which has had a crop of beans grown thereon and removed therefrom.—Take fourteen parts by weight of the first preparation; two part of the second preparation, and mix them with one part of common salt (containing two parts of silica)—two parts of gypsum, and one part of phosphate of magnesia and ammonia.

And such manure is also applicable for land on which peas, or other plants of a similar character, have been grown and removed.

Preparation of manure for land on which turnips have been grown, and removed therefrom.—Take twelve parts by weight of the first preparation, one part of the second preparation, one part of gypsum, and one part of phosphate of magnesia and ammonia.

And such manure is also applicable for land where potatoes or similar plants have been grown and removed.

The patentee has selected the above cases, because they represent the chief of the products cultivated in this country; [England] and in doing so, such average preparations are given as will be beneficial in most, if not in all cases, as manure, to be used after the different crops mentioned; but manures may be prepared according to the invention for other plants than those mentioned; and, if desired, manures may be made with greater exactness for those

plants which have been mentioned for particular cases, if the matters of which the plants are composed and the qualities are first ascertained, by burning the plants and analyzing the ashes, and then combining the manure according to the analysis. The manure so made is to be applied to the land in quantities as great or greater than the quantities of the elements which have been removed by the previous crop. It should be stated that, where the straw of wheat and other similar plants, which require much silicate of potash, is returned to the land as manure, that is considered to be the best means of restoring the requisite silicate of potash to the land; in which case, in preparing the manures above mentioned, the silicate of potash would be omitted. [*American Quarterly Journal.*

WATER, ITS PROPERTIES AND USES.

Water is a compound of two gases, oxygen and hydrogen.—Although existing when pure, only in the form of gases, yet in nature they are never found pure, and consequently never in this form. They are always either combined with each other in the form of water or with some other substance. In water they always are united in the proportion by weight of eight parts of oxygen to one of hydrogen, or by volume, one of oxygen to two of hydrogen.

Nearly three-quarters of the surface of our globe is water. The vast oceans that surround and separate the two great continents, are themselves equal to about two-thirds of that surface. But the large inland lakes and seas with the numberless lakes and rivers that intersect the land in all directions greatly increase the amount. From this great quantity we should naturally be led to expect corresponding uses. These are indeed great and various, and, in agriculture alone, quite indispensable.

The uses of water are two-fold—chemical and mechanical.

1. Chemical. From the well known composition of plants—about 90 per cent. being carbon, oxygen and hydrogen—it will be perceived at once that water is capable of affording two highly essentive elements of the vegetable system. We find in fact more than one-half the weight of all vegetables, when freshly gathered, is attributable to this fluid. Whether it is all actually existing in the plant as simple water may be questioned, but the two gases are there and in precisely the proper proportions to form it. Thus starch, gum, woody fibre, sugar, &c., all proximate principles of vegetable matter, may be regarded as compounds of carbon and water, for they consist of carbon united to oxygen and hydrogen in just the atomic proportions to form water.

During combustion of vegetable matter, a certain variable portion of the bulk escapes as water. This may be seen by holding a glass vessel as a tumbler, perfectly dry, over a fire or burning lamp or

candle. The fluid will immediately be seen collecting upon the inside of the vessel.

Now it is admitted that the water in these instances may be generated by the process of combustion, by the direct union of the gases. The hydrogen was there, and being burned in the atmosphere which contains oxygen would be converted into water, even if none of this latter gas were existing in the plant. But it must not be forgotten that there was a quantity of oxygen just sufficient, with the hydrogen, to form the same amount of water, and we are only able to account, rationally, for the disposal of this, by supposing it to be united with the hydrogen, and being already in the form of water in the plant before it is burned.

A trifling experiment will seem to demonstrate this to be the fact. If a small stick of wood is subjected to the action of sulphuric acid, the water is separated, by its action, from the woody fibre, and charcoal is the residue. This result is owing to the powerful affinity existing between this acid and water.

It is not then certain that the water, which growing plants absorb and appropriate, is changed in any respect, in entering into the composition of the body of the vegetable, but may be still the same, though having but its former sensible properties and its fluid form by union with a third body—carbon—and we may safely consider those proximate vegetable substances, which consist of carbon and the elements of water, as actually compounds of carbon and water.

Water is then a highly essential part of the vegetable economy, and enters largely into the composition of plants. Its chemical relations are however, far more extensive than we have thus far seen. Almost every change which takes place in the soil or in the plant in preparing food or appropriating it to these purposes of nourishment, are more or less dependent upon this fluid. Indeed, without this, or other substance capable of supplying its place, all solid matter must remain almost unchanged and inactive. It is to its solvent power that the vast and varied changes constantly taking place around us and within us are owing. Let us examine for a few moments this power.

Water is capable of absorbing gases and many solids. Our readers need not be informed, in this age of scientific knowledge, that the food of plants is mostly derived from the air and earth in a liquid form, and that that portion which the roots absorb from the the earth is necessarily liquid. The leaves *may* imbibe gases, as such—the roots cannot. Here water is absolutely necessary to render them available as food. The power of absorbing different gases varies much. Thus water will absorb more than this own bulk of carbonic acid, and more than six hundred times its bulk of ammonia, and is thus capable of supplying a large amount of food to growing vegetables. In the form of rain descending from the clouds it absorbs the gases which have mingled with the atmosphere,

and carries them down to the roots of plants. In this manner it purifies the air for our use, while it affords nourishment to the vegetable world.

It is not in the form of water alone that it is capable of absorbing these gases, but it is found that in the form of ice and snow it absorbs them with astonishing rapidity. A certain quantity of ammonia is generally found in freshly fallen snow. This fact was first noticed by Liebig, and has since been confirmed by numbers of others. The quantity will of course vary with the amount of that gas in the atmosphere at the time of the falling of the snow. The portions of snow which fall first through the air, will of course absorb the most of the ammonia, and consequently it is found that those portions also nearest the ground contain the most. The stimulating properties of this gas as food for plants, are well known, and if the idea be true, which is a very common one among farmers, that grain grows under snow, it may be owing to the presence of this gas, carried down to the roots by the first snow that melts, and absorbed by them. Other gases are also absorbed by snow.

It will not be out of place here, to notice some other effects of ice and snow upon vegetation, and the soil. Snow forms a covering for the grain fields of the farmer, of a kind which is almost, if not entirely a non-conductor of heat. Thus the temperature of the surface of the earth is maintained in a uniform condition, and the delicate texture of young plants is not exposed to the sudden and fatal mutations of temperature which destroy them if unprotected. This is owing to the non-conducting properties of the snow as well as to the fact that it is light and porous, and contains air, which is also a body almost incapable of conducting heat.

Plants in the temperate zone are not liable to be destroyed by mere intensity of cold. The cause of their being winter killed, is their being exposed to great changes of temperature, by which the fluids of the vessels are suddenly expanded and burst. If a plant is frozen and then thawed out by the application of cold water, there is no danger of destroying its life. In this way plants which lie all winter under a mantle of snow, are safely thawed by the gradual melting of the snow, before they become exposed to the warm rays of the sun. But in winters, during which little or no snow falls, vegetation is constantly affected by the warmth of the sun, and again exposed to the intense cold of the winter night. These changes of temperature destroy them.

Water possesses a peculiar property, during the process of freezing, which is of great use in agriculture. Unlike other bodies, it does not follow the law of contracting by decrease of temperature. It observes the law till it sinks to the temperature of 40 deg. Fahr., when it begins to expand, and continues to do so till it is frozen. We do not stop now to inquire the cause. We would only refer to the practical use of this fact. And this is principally in the renovation and reproduction of soils and the reducing of rocks to a fine state preparatory to their being converted into soil. The pores of

the earth, baked and packed by the heat of a summer sun, become in autumn replenished with water, which freezes, and by its expansion breaks up the soil, and renders it porous and fine. All the parts are separate from each other, and being finely divided are reduced to a condition for the more ready control of the chemical affinities which are to reduce them to the state of a fertile soil.

The crevices of rocks are permeated by water, and its smallest openings absord that fluid, which freezes and cracks them, and breaks down the solid material into small fragments, or even into a fine powder, reducing it at once to almost the condition of a soil. This is the result of the simple mechanical action of water during the process of freezing. Its agency does not end here. No chemical change, with very few exceptions, can take place without the presence of water. It brings the materials into a fluid state, the state most favorable for the action of chemical affinities. It is largely composed of oxygen, a substance whose affinities have an almost infinite range, and by these two attributes it is enabled to reduce the rocks from which soils are formed into the elements of vegetable food; but its offices extend still farther. By the growth of vegetables in the soil, these elements are exhausted, and here water again is of use to restore the action which is to renew fertility and restore productiveness. In relation to manures the case is the same. Buried in the soil, and unwet by this fluid, they might lie for ages unchanged. It is by the decomposition brought about by the agency of water, that they are rendered available as nutriment to growing plants. So that, whether as the medium through which the food is conveyed to the roots of vegetables, or as the origin of those changes which prepare the food, water is an indispensable agent.

The effects of water in its different states, upon the temperature of the earth and atmosphere, is a matter of considerable importance to the agriculturist. It is a law well understood, that by evaporation of water, cold is produced, or rather heat is abstracted from other bodies in the vicinity. It is owing to this principle that many soils are called *cold*, and these are the soils which consist largely of clay, and retain the water which falls upon them, giving it off to the atmosphere by a gradual process of evaporation. The soil which is dry is in a condition to absorb the genial rays the sun, and become warmed for the proper growth of vegetation, whilst in wet soils the sun's heat is all absorbed by the water, and is expended in converting that water into vapor, with which it ascends into the air. There may be no other difference in the two soils of neighboring fields than this, and one will produce nothing but moss, and coarse grass and weeds, whilst the other will be highly fertile. From the presence of too much water, the temperature of the one is kept so low that decomposition of the materials of food does not take place, and if it does, there is not heat enough to sustain the vital energies of the plant.

This cause is the origin of the immense bodies of peat which occupy the low grounds of so large a portion of this country.—Carried with water whilst the vegetable matter is collecting, the cavity becomes gradually filled with a soaked and spongy mass which soon becomes dry, but only undergoes a partial rotting under the water. Such places, although the surface may be dry a portion of the summer, can never be made productive as long as they remain wet.

Here then, a practical rule suggests itself, and which has been worth more to the agricultural interests of some entire nations, than all the other aids that science has offered. We refer to draining; not to the old fashioned ditching which was once called draining, but to the thorough drying of the soil, by thorough draining, which has been practised in Britain to the almost entire renovation agriculture there. Thousands of acres which before were considered as good for nothing, have been reclaimed and made among the most productive lands of that kingdom. What would be thought in this country of a man who would buy a farm of 130 acres, and have immediately dug on it eighty or ninety miles of drains? And yet such is not by any means a solitary fact in England.

This pracess may not be as extensively necessary in this country as in Great Britain, and yet there is no soil which is not improved by making it of such mechanical condition as to readily discharge any superfluous water which may otherwise stagnate upon it. This is perfectly consistent likewise, with the doctrine of irrigation, where the water from running streams is made to flow over the land and saturate it. If the soil in this case be not perfectly permeable to the water so that it may readily pass through, more injury than good will be the consequence. The intention in irrigating land is to flow it with water holding in solution salts and gases, and decomposed matter of organic origin, part of which substances will be deposited in the soil. All water of creeks or rivers or springs, is charged with the soluble substances of the soil and rocks over which it passes, and the gases of the earth and air. These are all conveyed directly to the roots and into the circulation of plants.

Another effect of water in regulating the temperature of the air, may be found in those countries which lie contiguous to large bodies of water. Maritime countries—islands of the sea—indeed all lands near large waters, have always a milder climate than more remote ones. The fact is well known that the banks of our large rivers for some distance interior, are protected from early frosts by the heat given out by water during the process of freezing.

A fact may be mentioned here of some little singularity, and depending upon this cause. In the fall of the year, at evening, when the ground freezes for the first few times, it will be found that a thermometer suspended a few feet above the earth's surface will indicate a degree of heat from 1° to 3° above the freezing point, so rapidly is heat given out by freezing water.

The atmosphere is always charged with the vapor of water, and thus aids vegetable life and serves important purposes in the economy of plants. Some have thought that they required water only to live and thrive. This, however, is not so. And yet without it, the hopes of the husbandman would fail. It is the great agent in supplying plants with food, and as we have seen is itself a large constituent of all vegetable matter. [*American Quarterly Journal.*

DURHAMS *vs.* NATIVES.

L. Tucker, Esq.—In perusing the June number of the Cultivator, my attention was drawn to some editorial strictures, on page 178, in relation to the remarks of Mr. Buckminster, and other gentlemen who took part in the discussions at the weekly agricultural meetings at Boston, the past winter, and which have been reported in many of the papers published in that city.

Permit me to premise by remarking that, from the well-known high character and standing of the gentlemen who took part in these discussions, I do not entertain a particle of doubt that their object was to elicit and diffuse what they considered to be useful information among the agricultural community, as to the relative value of the different breeds of cattle for dairy purposes. The Durhams, Herefords, Devons, Ayrshires, and Natives, have each their advocates; yet discussions upon the value of these different breeds of cattle for dairy purposes, can be of little or no use to the public, unless predicted upon well established and reliable facts. Without this, discussion may continue for a century, and at the end of that time, the real merits of the question will remain in the same mystery and uncertainty as at its commencement.

In the discussions above referred to, one of the gentlemen, Mr. Buckminster, is reported to have said—"he was somewhat prejudiced against the Durham breed of cattle. He had taken much pains to know what was their product in milk and butter. He had invited owners of such cattle to show the yield of their dairies, and though he had found instances of very good cows of that breed, he was bound to say, that generally, they were not equal to the native cattle of the country.

From these remarks it would seem, that the owners of Durham cattle have declined comparison, and from this statement it might be inferred that they lacked confidence in their dairy qualities. This should not be so, as the agriculturists are deeply interested in establishing this point; and all who are the friends of this great branch of national industry should be willing to contribute to its prosperity, however it may affect their private interests.

The writer of this is the owner of a herd of Durhams of about forty head, young and old, and is willing, however it may affect his interest, to submit their dairy qualities to a fair test. He has now

on his farm eighteen cows and heifers, a part of which are in milk, and the remainder will calve in the couse of the summer. He can spare from other purposes, five of them to test their qualities in this respect in comparison with any other breed. He therefore accepts the offer of Mr. Buckminster on the following conditions, viz :

Any individual *now* the owner of a herd of not exceeding twenty cows, in milk and to be in milk during the present summer, may select from that number five cows, and the writer will select from his eighteen a like number to be put on trial in the course of the summer for thirty successive days ; the cows to run in pastures, and to have no other feed during the trial than pasture, nor for twenty days previous to being put on trial. The milk drawn from the cows on any one day of the first and last weeks of trial, to be measured in a sealed wine-quart measure, and also to be weighed ; the quantity of milk so drawn in these two days to be stated in quarts and pounds, as well as the weight of the butter made in the thirty days, and the result, stating that all these requirements have been complied with, to be verified under the oath of the owners of the cows, and that of one or two individuals who assisted in milking the cows and making the butter. The statements so made to be sealed on the first day of September next, and one copy to be directed, by mail, or otherwise, to Wm. Buckminster, Esq., Editor of the Boston Ploughman, and another copy to Luther Tucker, Editor of the Albany Cultivator, and by them to be published in ther respective papers.

Though the writer has great confidence in the superior combination of excellencies possessed by the Durhams, his opinion is not less favorable in regard to their dairy qualities in particular ; but whatever may be the result of the trial in question, it cannot fail to be of service to agriculturists ; and hence his inducement to make this offer.

Lest it may be thought that the writer's cattle have received high keep, he would state that his cows were kept during the past winter, on hay at night, and stabled ; during the day they were turned into the cattle yard, and fed upon cut cornstalks and straw, and were *not* fed upon roots. The cows which calved early in the season, were fed a small quantity of shorts or slops for two or three weeks before they were turned into pasture, but since then have received no other food than pasture.

If the proposition herein made is accepted, Mr. Buckminster will have the goodness to inform Mr. Tucker, Editor of the Cultivator, as soon as convenient.

V.

Troy, N. Y., June 8th, 1846. [*Albany Cultivator.*

PROTECTING TREES FROM MICE.

A correspondent of the Gardener's Chronicle, mixes soot and milk till of the consistency of that paint, and then applies it to the trees with a brush. This, applied once a year, he finds effectual protection against hares and rabbits. Would it not be equally so against mice ?

RADICAL EXCRETION OF PLANTS.

Several years since the theory was first put forth by M. de Candolle, of Geneva, that "plants possess the property of excreting by their roots substances which are formed in their texture, and which, if retained in them, would be injurious to their healthy growth and development." It was also contended by the same philosopher, that the excretions left in the soil by plants were injurious to the growth of succeeding crops of the same kind; and on this supposed fact, he based the expediency of a rotation in crops.

M. de Candolle's theory has for sometime been generally regarded as unfounded; but as no particular experiments had demonstrated its truth or falsity, the Highland and Agricultural Society of Scotland offered a premium of twenty sovereigns in 1844, for the best essay on the subject based on practical trials and results. This premium was awarded to Mr. Alfred Gyde, who produced a highly interesting and valuable paper, which we find in the March number of the Transactions of the Highland Society.

The points to which Mr. Gyde directed his inquiries, were as follows:—

Do plants, or do they not, during their healthy growth excrete matter from their roots?

If they excrete, is the matter excreted organic or inorganic? What is its composition?

Does the matter excreted by different classes of plants possess properties peculiar to each class? If so what is the peculiar property of each? Is it identical with the sap of the plant, or does it differ?

What is the physiological action of the roots of plants by which excretion takes place?

Have plants the power of excreting by their roots, substances previously absorbed, and which are noxious to them?

Will germination occur, and the growth of plants proceed, after the seeds have been impregnated with noxious matters?

Will seed germinate and grow in poisoned soils?

Why do plants refuse to grow on some soils, while they grow freely on others?

In order to grow the plants in such a manner that they could at any time be removed, and the roots separated from the soil without their being mutilated or broken, he adopted the following plan. The plants were grown

1. In garden-soil, placed in pots, and plunged in the earth.
2. In pots filled with silicious sand, the growth of the plants being promoted by waterings with weak liquid manure.
3. In pots filled with silicious sand which had been repeatedly washed in boiling water.
4. In pots filled with damp moss.
5. In pots filled with coarsely powdered charcoal.

The plants grown were wheat, barley, oats, rye, vetches, kidney-beans, beans, peas, cabbages, mustard, and turnips.

To ascertain whether matter is or is not excreted by the roots of plants, Mr. Gyde caused the plants to be removed from the pots in which they had grown, and had them carefully and thoroughly washed in a gentle stream of water,—"after being carefully dried on folds of filtering paper, they were placed in glasses containing distilled water, which had been exposed to the atmosphere for some days. In this situation the roots were carefully excluded from the light, and kept at as uniform a temperature of about 55 degrees as practicable, the green portions of the plant being fully exposed to the action of light and air, the water in the vessels being renewed as it diminished, from absorption by the plant and evaporation from the surface.

From several tables which are given, the particulars of the different experiments are seen. In relation to the results, Mr. Gyde observes:

"From the above experiment it will be seen that the roots of plants impart to water a portion of soluble matter or excretion, and that this excretion appears to be yielded in greater abundance by plants having large and spongy extremities to their roots, as beans, than by those possessed of fine, thread-like extremities, as is the case with wheat or cabbages. It will also be observed that in some instances the water has acquired an odor which is inseparable on the application of heat, and may be distilled over when the water is placed in a retort; the plants which impart odor to water, as the bean and cabbage, are also characterized by emitting a similar odor from their leaves. Plants when in bloom were observed to emit a larger portion of excretion than when young, or when ripening their seeds; but the amount of excretion obtained even when many plants were operated upon, was very trifling, seldom more than a grain in weight when dry."

To ascertain whether the soil which had produced the plants contained any excretion, the following experiment was tried.

"Sand, which had been well washed with boiling water was planted with beans and peas; these plants were supplied with distilled water, and placed under the most favorable circumstances for healthy vegetation. After they had grown in the sand three weeks, they were removed, and the sand washed with distilled water, filtered, and on evaporation, yielded a portion of both organic and inorganic matter, in every respect similar to that obtained by the immersion of the roots in water. Plants of the same kinds to those used in the former experiments were cut from their stems, the lower extremities of which were plunged in distilled water, so that the descending sap, which it was presumed would escape, might be examined and compared with the radical excretions from the same kinds of plants, and it was found that in each instance similar results were obtained on evaporation of the water in which the cut plants had been immersed as those from the water in which

the roots of similar plants had excreted. Hence we may conclude that the matter obtained from the roots of plants, or radical excretion, is similar to the sap of the plant from which it was excreted."

Mr. Gyde's observations in regard to the physiological action of the roots of plants, and the phenomena attending the circulation of the sap, are worthy particular attention.

"The roots of plants are described as the downward prolongation of the stem, as the trunk and branches are the upward development into the air—the spongioles and extremities of the roots being the newest formed and extending portions and that by these spongioles, fluids are taken up from the soil and conveyed to the circulation of the plants."

"The fluids thus absorbed are carried by the vessels of the most recently formed wood to the leaves, where, after undergoing certain changes during its exposure to the action of air and light, by which much water is given off by evaporation, the elaborated sap is returned by another set of vessels situated in the inner bark of the tree, to the roots, supplying during its descent, those constituents necessary for the healthy secretions of the plant.

"The sap having arrived the roots, the new fluid is added to it from the soil, and the ascent again commences by the vessels of the new wood, this action continually taking place during the life of the tree, but progressing more rapidly at one season of the year than at another.

"Many and ingenious are the theories which have been formed to explan the ascent of the sap. Of these, that which was first pointed out by Detrochet appears most probable, and is now generally received by physiologists. Detrochet found that if, into a glass tube, having one end covered with animal membrane tightly secured over it, a strong solution of salt in water or sugar in water be poured, and the end covered with membrane, be immersed in a vessel containing water, that within a few hours the liquid in the tube will be found to have risen several feet. This ascent of the liquid in the tube being caused by a portion of the water from the outside of the tube passing through the membrane and mixing with the solution in the tube; and at the same time a portion of the solution will be found mixed with the water outside the tube—this action continuing until both liquids become of the same specific gravity; the former of these actions, Detrochet terms *endosmose*, and the latter *exosmose*, and he attributes the action to the effect of electricity.

"If we allow the liquid within the tube to represent the sap of the tree—the membrane covering the tube to represent the spongioles of the roots—and the water in which the lower portion of the tube is immersed, the water of the soil, we have a combination of circumstances which approach the state of the growing tree, the sap in the tree always being of greater specific gravity than the water surrounding the roots. Under these circumstances, there is every

probability that a similar action to the one just described is continually going on in the plant during the active period of its growth—water would be taken into the plant through the spongioles of the roots by endosmose, and a portion of the sap would escape into the soil by exosmose; the sap consisting of both organic and inorganic matter in solution in water, and would ever be of greater specific gravity than the water in the soil, arising from the exhalation of water continually going on from the leaves, and consequent concentration of the sap prior to its descent.

To demonstrate how far the action above described actually takes place in the living plant, Mr. Gyde made several experiments:—

"Several funnel-shaped glasses were prepared, which would hold about 3 fluid ounces of liquid each, and present $2\frac{1}{2}$ square inches of membraneous substance, through which endosmose might take place; these glasses were filled with saline solutions, and also solutions of organic matter, and plants cut from their roots immersed in them through the upper opening, where they were secured by collars of Indian rubber, the portion covered with membrane being immersed in water. In each instance the saline solutions were rapidly absorbed by the plants, they were detected in all parts of their structure, and a portion of the solutions was found to have passed by exosmose into the water in which the membrane was placed.

We must pass over the details of many of the experiments which are given by Mr. Gyde. It is proper, however, to observe in passing, that he ascertained that plants may be made to absorb various metalic salts which are noxious to their growth—such as solutions of zinc, copper, mercury, arsenic, lead, iron, barytes, &c.,—the effect of which was to destroy the plant sooner or later; showing that plants do not possess the power of excreting noxious substances previously taken into their structure, or at least, that they have not this power in a sufficient degree to preserve their lives when placed in a situation to absorb these substances. He shows that excretions of plants in a healthy or natural condition, are not prejudicial to succeeding crops. He cites an example of an acre of ground having produced an average of 32 bushels of wheat per acre for 12 consecutive years—the ground having only "an occasional light dressing of manure, the stubble generally being burned and the ashes spread on the land."

The inferences to which Mr. Gyde arrives from all his experiments and observations are chiefly the following:

"1. That the commonly cultivated plants of the natural orders Graminæ, Leguminosæ, and Cruciferæ, excrete by their roots soluble matters.

"2. That the excretions consist of both organic and inorganic matters.

"3. That the quantity of excretion thrown off by any single plant is very small, and excretion can only be satisfactorily examined when collected from a number of plants.

"4. That plants absorb metalic salts when in solution in water, and that they quickly die unless the solutions are very largely diluted.

"5. That seeds impregnated with poisonous substances may germinate if the quantity of the poison be very minute, but in most cases the seeds perish.

"6. That plants are not injured by their excretion being re-absorbed into their structure as was supposed by M. de Candolle.

"7. That the necessity for a rotation of crops arises from the soil in most instances being unable to supply those earths and saline constituents required by plants."

[*Albany Cultivator.*

THE POTATO ROT.

The Hartford Courant publishes the following:—

Diseased potatoes.—Mr. Editor,—As the potato rot is assuming a very alarming appearance within the last week, in this vicinity, I will give you the result of an experiment in my garden the present season.

Noticing sometime since a recommendation to mow off the vines of potatoes to prevent the rot, I caused the vines from a part of my Mercer potato patch in my garden to be mown off when the potatoes were half to two-thirds grown, and the result is highly gratifying. Those not mown off are a large proportion of them diseased and rotten, and those mown off not one diseased or rotten potato can be found.

I think farmers who have late fields of potatoes, where the vines as yet show no signs of disease, (but if suffered to remain will in a few weeks become worthless,) may be able to save them by mowing the tops off without delay. The potatoes where the vines have been mown, appear nearly or quite as large as those where the vines are not mown off. One ounce of prevention is better than a pound of cure!

If any are skeptical upon the result of my experiment, they are respectfully invited to call and examine my potato patch (No. 18 Front street) for themselves. M. C. WEBSTER.

Hartford, August 6th, 1846.

The potato rot.—Every where in this vicinity we hear of the progress of this disease in the potato. The new crop, it is feared, will encounter even a worse fate than the crop of the last year.

An exchange paper states an important fact, if to be relied upon. It states that A. R. Lawrence, Esq., of Long Island, recently cut some of the diseased potato stalks from his farm, and on opening them, discovered *a worm, nearly an inch long, in the centre of each*, which had completely destroyed the vitality, and of course decay in

the potato followed. This, undoubtedly, it adds, is the cause of the disease, and now it only remains to discover a remedy, and the life of the *varmint* is short. [*Albany Argus.*

The potato plague.—From present appearances the destruction of the potato crop will be more extensive this year than ever. We hear almost daily of the decay or drying up of the vines. Joseph Smith, Esq., of Hadley, informs us that this is the case with his potatoes with which he took great care in planting, and used salt and plaster freely. He has also had conversation with a farmer in Belchertown, whose vines had begun to decay. Is there no remedy? [*Northampton Courier.*

THE STRAWBERRY—FERTILE AND BARREN FLOWERS.

It often happens, where accurate experiments take strongly opposite grounds in theory, that "both are right, and both are wrong." Three opinions appear to have been adopted relative to the character of the strawberry, or of certain highly improved varieties; one is, that there are staminate or barren plants, which are absolutely necessary to the fertilization of the pistillate ones; this opinion is held by N. Longworth and others of Cincinnati. A second opinion regards these staminate plants as wholly useless, and as cumberers of the ground, and should therefore be all rooted out; this is held by A. M'Intosh of Cleveland. A third opinion, held by A. J. Downing, C. M. Hovey and others, is intermediate between the two others, and regards sterility, not as an essential, but as an induced character, and that though some varieties may be increased in fruitfulness by the proximity of staminate plants, that the latter are not always essential to the perfection of the fruit.

The writer has lately made some microscopic examinations, with an achromatic instrument of the best construction, with a view to elicit light on the subject, the results of which may possibly be interesting to cultivators. Three varieties were selected,—Hovey's Seedling, usually but erroneously regarded as destitute of stamens, and as entirely pistillate; the Dundee, in which the stamens are small, but readily observed; and the large Early Scarlet, where the stamens are large, fully developed, and very conspicuous. In Hovey's Seedling, the stamens, which, as in all other flowers of this natural order, adhere to the inner rim of the calyx, are so short, that they are entirely hid by the mass of longer pistils. They are evidently imperfect and *flattened*, partaking thus, in a slight degree, the character of the petals of a double flower.

To ascertain if the anthers of Hovey's Seedling possessed any fertilizing power, many careful observations were made with a compound achromatic microscope, with the best constructed sextuple object glasses. From some of the anthers, no pollen (or fertilizing

dust) was obtained; they, however, usually afforded a very small quantity; and their fertilizing power appears to be slowly developed, as they burst and discharge the minute portions they contain, in most cases, about the time or after the petals have fallen. The anthers of the Dundee, afforded pollen in much greater quantities; and the Early Scarlet yielded it in profuse abundance. It may be proper to remark, that from the comparative smallness of the stamens in the Dundee, it would be pronounced by a superficial observer, as pistillate only. The Early Scarlet was merely taken as a representative of several other varieties possessing perfect flowers, as the Elton, Ross Phœnix, and Alpines. The Duke of Kent was frequently found with as imperfect stamens as Hovey's, and again with as perfect flowers as any others.

A single experiment was tried, in cultivation, with Hovey's Seedling. A bed of this variety, twelve feet from a bed of the Early Scarlet, has, in most cases, perfect and well formed fruit. Single plants had been also placed at distances from the first bed, of five, nine, and twelve rods respectively; on all these equally, the fruit is very evidently more imperfect, most of the berries being only partially developed from imperfect fertilization, and but few fully formed and well filled to be found. These were all in a newly planted field, far away from any other strawberries. This experiment, so far as it goes, (with the microscopic examinations,) tends to show, that though Hovey's Seedling may sometimes fertilize itself, yet the proces is greatly facilitated by nearness to other strongly staminate varieties; but to be more satisfactory, the flowers should have been covered with a gauze-covered frame, so as perfectly to exclude the bees. In the present instance, no bees were ever noticed on any of the flowers. J. J. T.

[*Albany Cultivator.*

SELECTION OF SEED CORN.

Liberty, Bedford county, Va. 20th, 1846.

To the Editor of the American Farmer.

Dear Sir.—As the time approaches when the corn crops should be gathered, I wish (through your excellent American Farmer) to suggest to each farmer who reads your paper, and through them to every neighbor of their's who may not read it, the necessity and advantage of selecting seed corn in the fall as they gather their crops of that great staple of our country. I wrote to our friend, Mr. Skinner, a long letter on this subject some twenty odd years ago, which was published in his American Farmer, and soon thereafter distributed to many, some of my seed-corn, the increased product of which all acknowledged, and some of them profited considerably no doubt, by the suggestions; and selling their seed corn

at high prices (Mr. Baden, for instance :) and some five or six years ago, I again wrote a short note, also published in the same paper. To the many who never saw those letters, who now read your paper, I would advise, that in cutting the tops off their corn this fall, to leave the top on those stalks having two or three fine ears, and which are very forward, and the shuck or husk dry and white, thereby showing their forwardness. By the top, they can easily distinguish at gathering time the seed corn, and gather and house it to itself, and not take the shuck off until planting time in spring, keeping it until then secure from rats and vermin. And by continuing this process a few years, they will materially increase their corn crops, with so little trouble that no practical farmer should fail to try it.

I have never known one to try it, who did not acknowledge its benefits and increased yield of corn. Several have lately rode through my corn crop, and every one expressed their great surprise at seeing vastly more stalks with four and five fine large ears on each, than they ever saw before; and not one in many dozens without two or three fine ears on them. I ask all to try it a few years, and if not pleased with the result, to discontinue it. By this process they materially increase the product and increase its forwardness. I am fully satisfied from long experience of the great advantage of reserving the best of many of our products for seed, and letting them grow fully ripe before harvesting; and earnestly recommend the same to all cultivators of the soil.

In haste, your obt. serv't. &c.

WM. COOK.

WOOL GROWING.

Mr. Editor,—Can you tell me what encouragement there is for a wool grower to strive hard to improve his flock, while the present feeling and policy of the manufacturers exist? For years the farmer has been deafend with the cry that wool is lower this, than last year; and now their agents talk of its being five or six cents less, and they must buy it at this reduction or not at all. I will venture, if a memorandum had been kept for a few years past, it would be found that by this time they would require a small premium to induce them to take it at nothing, if their assertions are to be believed. I would ask the manufacturers, if they believe this course just, even to their own interests? Can they expect the farmer to spend his time looking up fine crosses and paying $20, $30, or even $50 for bucks to improve his flocks, if he is always to be met with the never failing cry of "wool is falling." Let me tell them that a silent change is fast going on; heavy fleeced, middling wool, is fast superseding the really *fine*. Why, because no discrimination is made between the qualities, commensurate with the expense of producing the fine. Will they be wise in time for their own interest?

A WOOL GROWER.

[*Albany Cultivator.*

[Communicated for the Southern Agriculturist.]

EFFECTS OF LIME ON THE BUG AND CATERPILLAR.

Mr. Editor,—Some information lately acquired, may prove valuable to the planters, and consequently beneficial to the whole country. Mr. William Bell, a very respectable planter on Cooper River, informs me, that last year when the bugs were destroying all the crops on that river—both of high and low lands—the Rev. Dr. Bachman asked him for some of the bugs to try experiments with. As they were very plenty, Dr. Bachman was soon supplied. He first tried spirits of turpentine on them, without the smallest effect: next, a solution of corrosive sublimate, equally without effect: he then sprinkled them with lime, and the bugs were killed immediately. While this was fresh in Mr. Bell's recollection, he went up to his plantation in the next steamer, and in the passage up, told Governor Bennett of the experiments. They both concluded to try the lime as far as possible, the crops being in a desperate situation. Mr. Bell applied lime to about 80 acres of rice, and Mr. Bennett to a larger field, and both to their high land crops. Both of these gentlemen were perfectly satisfied, that the lime had been very beneficial by killing the bugs, and both made much better crops than their neighbors—ascribing their success to the use of the lime. Mr. Bell also applied it this year to a corner of his rice-field which was not well covered with water, and consequently attacked by the bug. It was again completely successful; the bugs were killed; the rice recovered its verdure, and is now in ear. Mr. John Ravenel was complaining last year of the bugs having attacked his oats, as well as the rest of the crop. Mr. Bell recommended the lime, Mr. Ravenel applied it, killed the bugs, and saved his crop.

Mr. Winborn Lawton, on James Island, was saying, that he never had seen finer fields of cotton than his were, until the worm took it about the 10th ult. That the destruction was now so great, he would freely bargain with any person that would undertake to feed and clothe his negroes, and take all the cotton that could be gathered from his whole plantation. He had been previously estimating the sales of his fine sea-island cotton to afford him from $7,000 to $9,000. In the course of conversation, I asked Mr. Lawton if he had manured his cotton, and with what manure? He said that he had manured highly with the best stable manure from Charles-

ton. I then asked if he had manured all alike, had he made no addition to this stable manure? He said yes, *to one part of a field he had also applied lime, and by the by, this is the only part not attacked by the worm or caterpillar.*

We sincerely hope, that this exemption may continue in whole, or in part, all the rest of the season. We sincerely hope, that other planters who have limed their cotton, may be equally exempt and willing to report their success. We sincerely hope, that others may yet save their cotton crops, from the destructive caterpillar, by a top-dressing of lime, as the Cooper River planters saved their highland and rice crops from the bug. Z.

NOTE.—We have read in the public prints, of the ruined state of the cotton crop, in various parts of Texas, Louisiana, Florida, Mississippi, Alabama and Georgia, as well as on the Sea-islands, and other parts of this State, which will, no doubt, materially injure and diminish the crop of 1846. Indeed, the heavy rains of August, in this State, will certainly lessen our crop.—*Editor.*

At the Anniversary Meeting of the Agricultural Society of South-Carolina, held on Tuesday 15th August, the following officers were re-elected:

J. H. TUCKER, *President.*
JAMES ROSE, *Vice President.*
F. D. QUASH, *Corresponding Secretary.*
JOS. F. O'HEAR, *Recording Secretary.*
ED. BARNWELL, JR., *Treasurer.*

Dr. James B. Davis of South-Carolina, left Washington city as Bearer of Despatches to our Embassy near the court of St. James at London, and also to Constantinople. Dr. Davis is an experienced cotton planter and goes to Turkey, on the invitation of the Sultan in order to direct the introduction of the cotton plant into the "Ottoman Empire." Dr. J. Lawrence Smith, a distinguished young chemist and Charlestonian, is associated with him in the enterprise, and will proceed *en route* for the "City of the Sultan" in a few weeks. We wish them a prosperous mission.

TO OUR SUBSCRIBERS.

We shall continue to publish the names of those generous patrons, who pay us for the *Southern Agriculturist*, because we think they are supporting a work of public utility, and performing the part of patriots. In order to assist those at a distance who have not complied with our frequent calls, we insert a method by which we may get our dues through the Post-office. An order on the Postmaster in Charleston, will be thankfully received; the following is the form:

P. O.,————(Date.)

Sir,—Please pay the Publisher of the Southern Agriculturist, ——— dollars, it being the amount this day deposited by A. B. as subscription money for said paper.

(Signed,) C. D., *Postmaster.*

To the Postmaster at Charleston.

Next, a notice to the Postmaster on whom the order is drawn:—

P. O. ————, (Date.)

Sir,—Mr. A. B., has this day deposited in this office ———— dollars, which you will please pay the publisher of the Southern Agriculturist, on presentation of my order on you for the amount.

Respecfully, yours,

C. D., *Postmaster.*

To the Postmaster at Charleston.

This should be sent under frank to the Postmaster at Charleston, before the money can be drawn.

LIST OF PAYMENTS.

Mr John L Nowell,	1846	Mr G W Kirk, Bluffton,	1835. '36
Maj G C Geddes,	1846	Mr Wm J Grayson,	1846
Rev Dr Bachman,	1846	Rev P L Wade, Georgia,	1846
Mr K S Ball,	1846	Dr Thomas Legare,	1844, '45, '46
Mr Benj S Rhett,	1846		

TO OUR CORRESPONDENTS AND READERS.

We have concluded in this Number Mr. Poinsett's Agricultural Address, which has been spoken of as highly interesting, and worthy the perusal and attention of the Planters and Farmers of South-Carolina.

We beg attention to the article on *Scientific Agriculture*, its advice is worth following, and may be productive of good among our inexperienced young planters.

We thank "Z" for his observations *on the effects of lime on the bug and caterpillar.* We hope those troubled with those *pests* will try its effects.

The rest of the articles will recommend themselves.

NOTICE.

We have been informed, by a Planter, who resides near the city, that he can supply persons wishing to *purchase* from his Stock of CATTLE, SHEEP and HOGS, with those of the best breed. Having imported a very extensive Stock of the newest varieties. His terms are moderate. Apply at the office of the Southern Agriculturist, No. 4, Broad street.

The Subscribers to the Southern Agriculturis are reminded, that the Price of the Journal was reduced to $3, to all those who paid in advance;—those who are still in arrears for this and former years are respectfully solicited to make their payments.